Standard Operational Procedure for Fetal Growth- Risk Assessment, Prevention and Surveillance.

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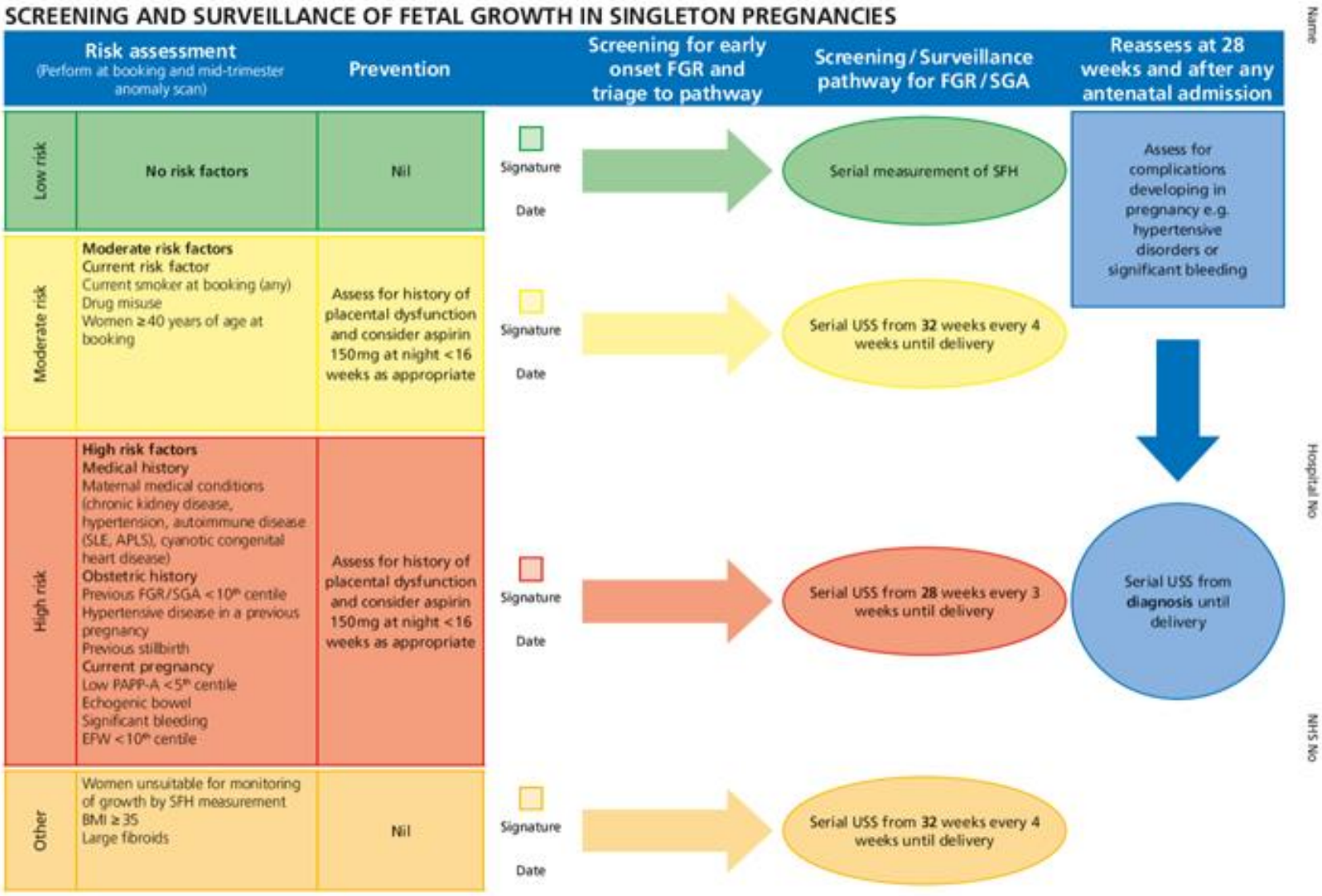
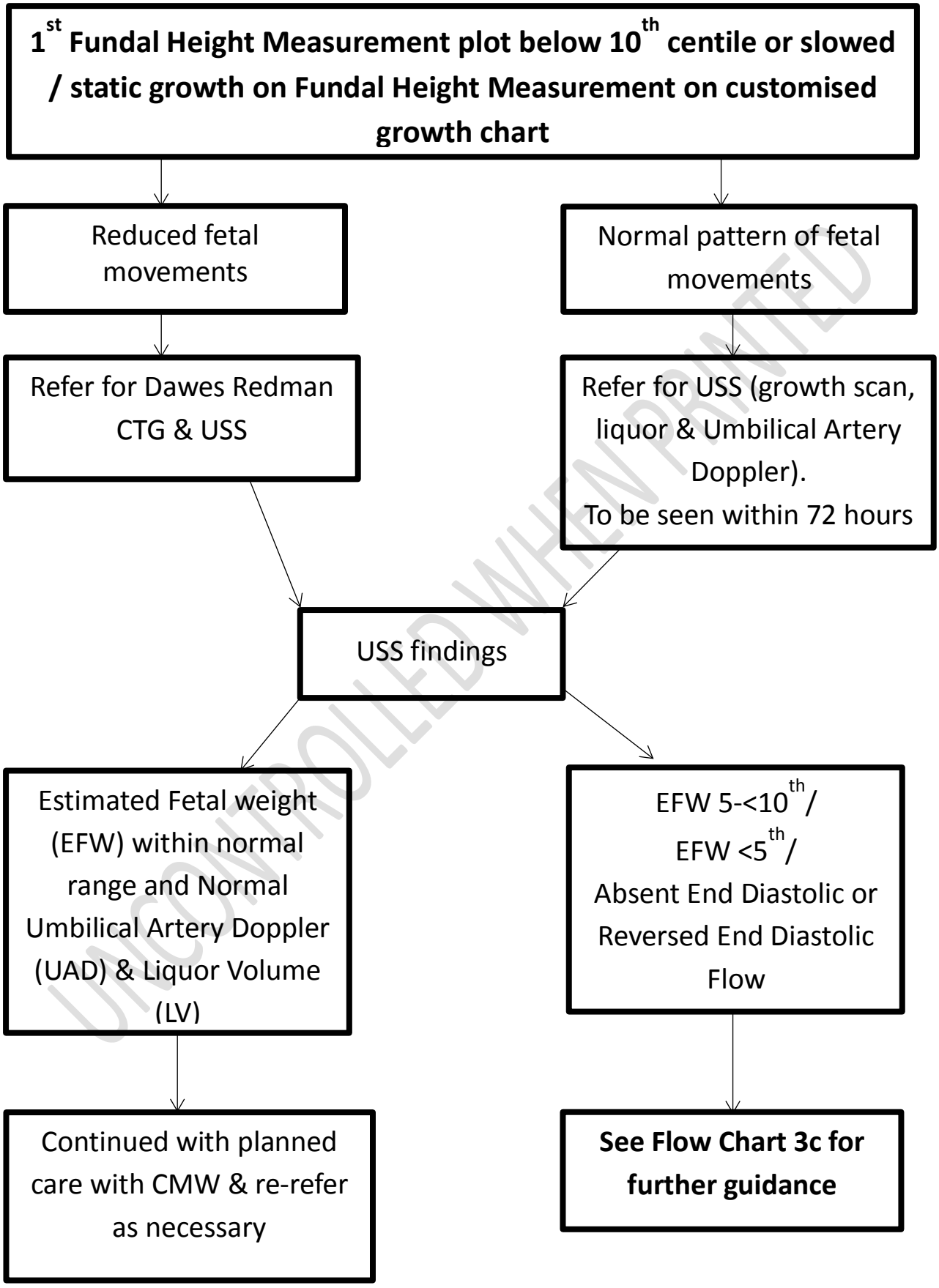
Review:	23RD July 2023

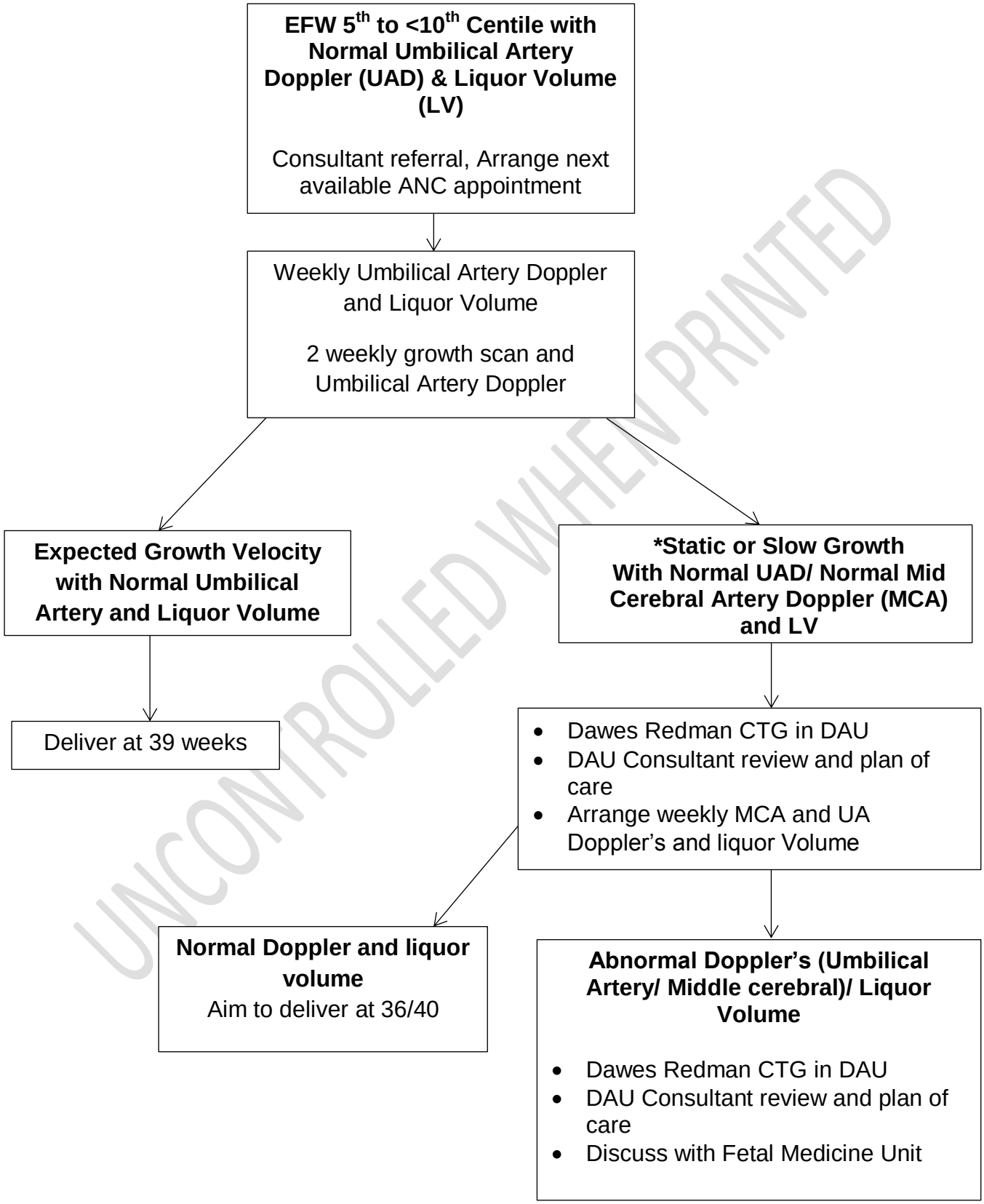
Flow Chart 1: Risk Algorithm



Flowchart 2: Suboptimal Fundal Height Measurement (FHM) Pathway

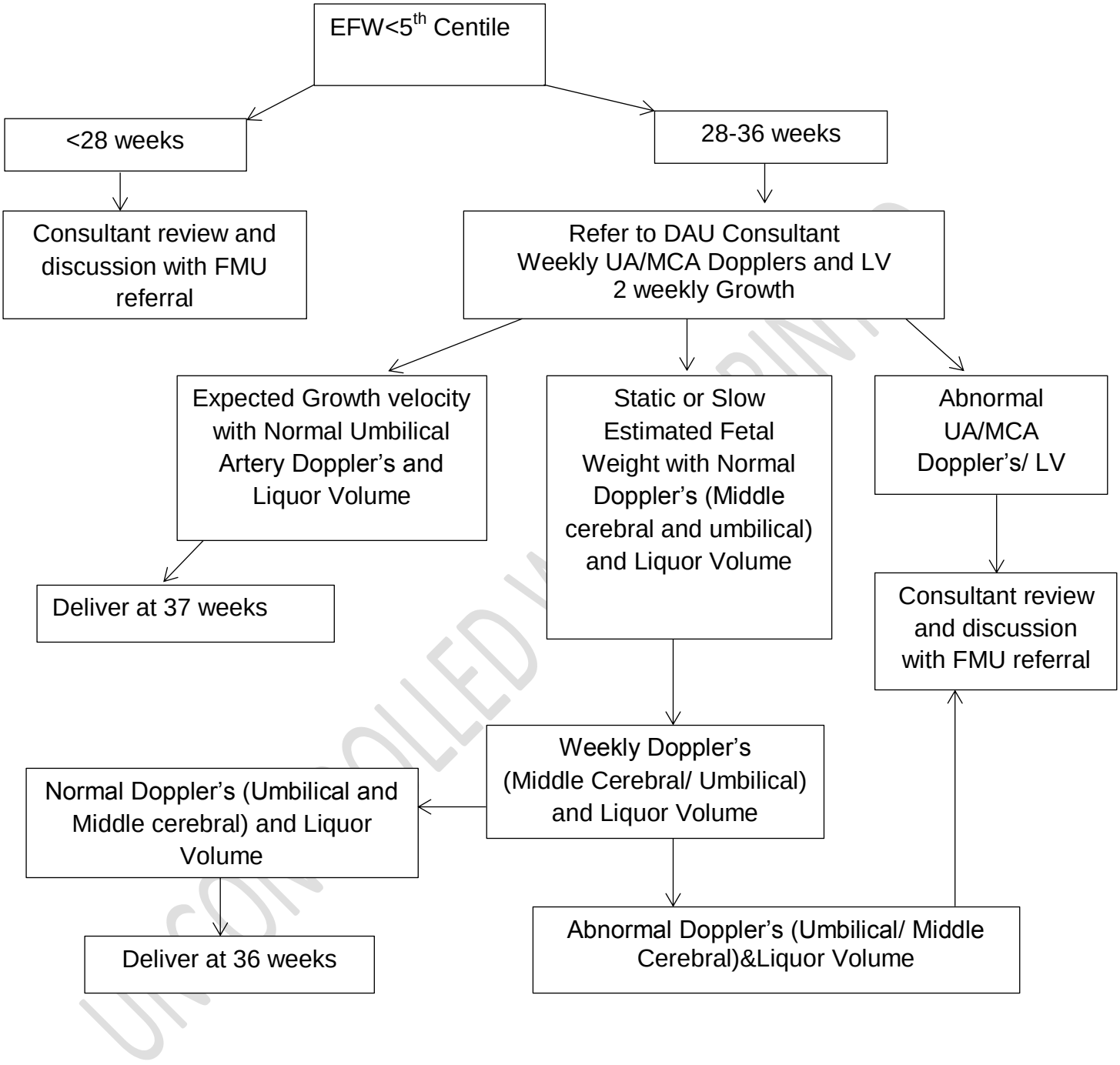


Flowchart 3a: EFW between 5th and 10th Centile with Normal Umbilical Artery Doppler and Liquor Volume

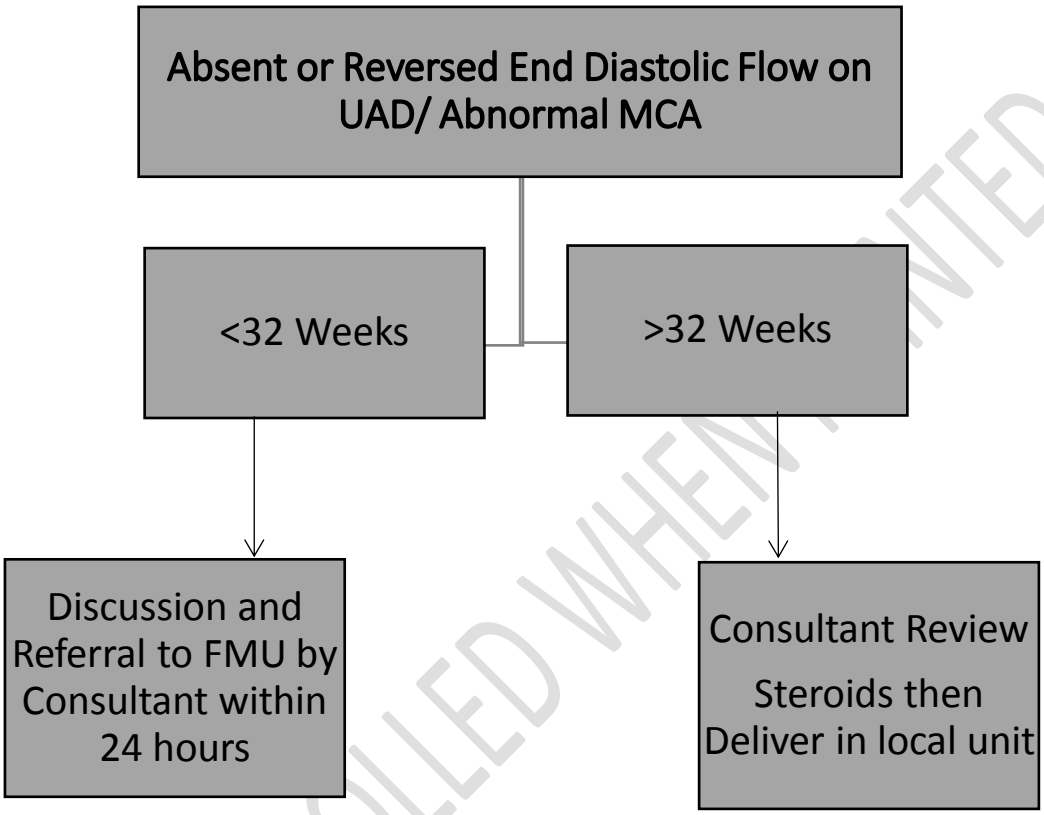


* see page 8

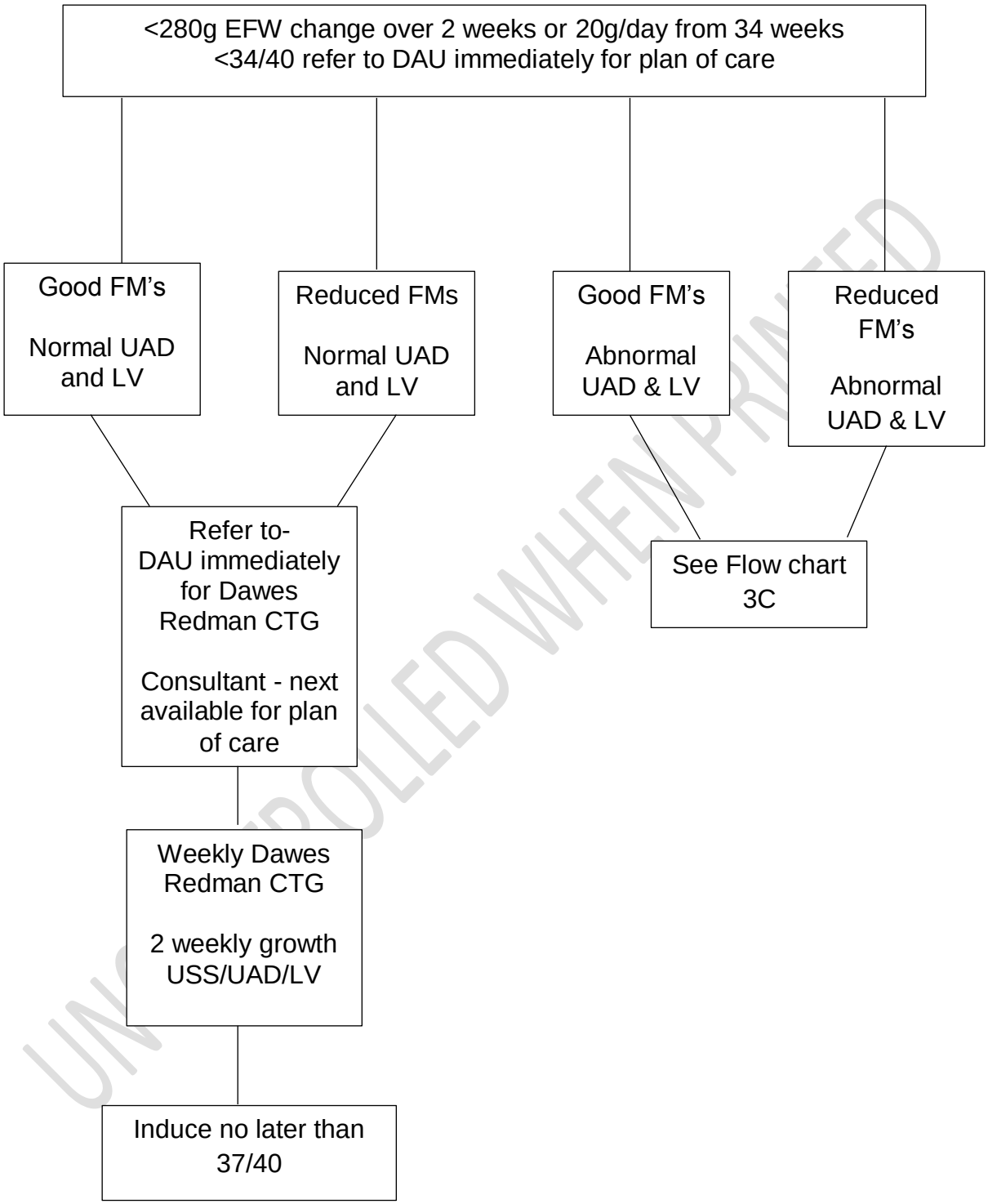
Flow Chart 3b: Estimated Fetal Weight (EFW) <5th Centile



Flowchart 3 c: Absent or Reversed End Diastolic Flow



Flow chart 4: Static/ slow Growth between 10th and 97th centile ≥34/40 on USS



1. Purpose/ Background

This Standard Operating Procedure (SOP) is based on the recommendations from Saving Babies Lives Care Bundle v2 .Up to 40% of 'unexplained' stillbirths are small for gestation age (SGA) and thought to have suffered fetal growth restriction (FGR). These babies are at increased risk of perinatal acidaemia and hypoxia, operative delivery, neonatal encephalopathy and cerebral palsy.

Delivery decisions of SGA/FGR baby are a difficult one. Early term delivery reduces the risk of rare but serious adverse events (stillbirth or neonatal death) while increasing the risk iatrogenic less severe adverse events. Decision-making balances the risks of causing mild harm to relatively large numbers of infants in order to prevent serious harm to a relatively small number.

2. Scope

This document is for use by all obstetricians, sonographers, midwives, screening staff and HCA's and it applies to all women cared for by the Maternity Services at St Marys Hospital.

3. Responsibilities

It is the responsibility of all Midwifery Nursing and medical staff to:

- Access read understand and apply this SOP
- Attend any mandatory training pertaining to the SOP

It is the responsibility of the department to:

- Ensure the SOP is reviewed as required in line with trust and national recommendations
- Ensure the SOP is accessible to all relevant staff

4. Procedure

4.1 Definitions

Customised Growth Chart is the primary screening tool produced by the Perinatal Institute GROW customised fetal growth chart used to plot both fundal height measurement (FHM) in routine antenatal examination and estimated fetal weight (EFW) following an ultrasound scan (USS).

Small for Gestational Age

(SGA) refers to an infant whose estimated fetal weight (EFW) and/or abdominal circumference (AC) is below the 10th centile.

Babies between 3rd – 10th centile will often be constitutionally small and therefore not at increased risk of stillbirth. Care of such babies should be individualised and the risk assessment should include Doppler investigations. The presence of any other high-risk features for example, recurrent reduced fetal movements, and the mother's wishes. In the absence of any high-risk features, delivery or the initiation of induction of labour should be offered at 39+0 weeks.

Fetal Growth Restriction / Intrauterine Growth Restriction / (FGR/IUGR)

FGR can be suspected in the antenatal period if there are ultrasound features such as abnormal Doppler studies, or reduced liquor volume in addition to reduced growth velocity. The term intrauterine growth restriction (IUGR) ***should not be used*** unless a fetal medicine unit (FMU) assessment has clearly shown abnormalities other than fetal size (ie placental insufficiency).

Management of SGA/FGR

When managing fetal growth problems it should be appreciated that small for gestational age (SGA) (estimated fetal weight (EFW) <10th centile) and FGR (where a baby fails to reach its growth potential) are distinct entities. Although SGA babies are at increased risk of FGR compared to appropriately grown babies; babies <3rd centile are far more likely to be FGR than babies between 3rd – 10th centile.

Large for Gestational Age- is not within the remit of this guideline

Slow or static growth – see flowchart 4

Is defined as <280g EFW change over 2 weeks or 20g/day ≥ 34 weeks by USS. These women should be induced at no later than 37 weeks. <34 refer to consultant for plan of care

4.2 Risk assessment for FGR and management of women at the booking/1st Trimester USS appointment

Women should be screened at booking and throughout pregnancy for the identification of risk factors for SGA/FGR using the Risk algorithm (SBLv2 2019) in Flow Chart 1 and referred for USS as necessary as conditions develop/change

4.2.1 Roles and Responsibilities

- **All Staff** Routine enquiries of fetal movements (FMs) must be made at every visit and documented (see SOP- Reduced Fetal Movements)
- **Community Midwife (CMW) Responsibilities –**
    - To use the algorithm Flowchart 1
    - To identify risks at booking and refer accordingly.
    - To ensure that singleton pregnancies with no evidence of diabetes will be assigned to one of the 5 groups in Flowchart 1 (multiples and diabetes found later will be adjusted)
    - To assess need for Aspirin
    - To submit the letter to the GP (Appendix 1) for aspirin prescription
    - To continue fetal growth surveillance in low risk women using fundal height measurement (FHM) at 3-4 weekly intervals
    - To perform FHM* at 26-28/40 for those women who commence USS at 32/40
    - To ensure that if Fundal Height Measurement is abnormal at any gestation >26/40 – follow flow chart flowchart 2
    - To identify and complications affecting growth during the pregnancy and refer as appropriate
    - To ensure that any women, who are identified at booking as smokers but have abstained at the 1st Trimester USS, should have an USS booked at 32 weeks. If the woman's Carbon Monoxide monitoring and the USS shows normal growth/Umbilical Artery Doppler/Liquor Volume, she can return to FHM with the CMW and USS discontinued. If the woman returns to smoking, the CMW can re-refer.

**At the time of writing, the CO monitoring service has been suspended due to the Covid-19 Pandemic – until restored all smokers that had stopped smoking by the 1st trimester scans will have serial scans as Appendix 1*

**FHM is not required once the woman is on scan pathway*

- **Antenatal Clinic (ANC) Staff Responsibilities -**
    - To generate the GROW chart using the Perinatal Institute's software available in the ANC. The woman's height, weight, (BMI) ethnicity and parity of the woman along with birth weights of previous children (born to the mother) are used to identify a pregnancy at risk of FGR/SGA Age with the EDD generated by the ultrasound scan. The chart must include the 3rd to 97th centile lines. This GROW chart has a unique identifying number to generate and record the birth weight centile post-delivery.
    - In the cases of a multiple pregnancy a chart for each baby will need to be generated
    - To attach the appropriate sticker system to the GROW chart-
        - Pink sticker to highlight the need for Fundal Height Measurement at 26-28/40 and
        - Red sticker for serial scans. The sticker system is used to easily categorise the reasons for antenatal scan by the labour ward staff at delivery.
        - Green sticker identify the SGA/FGR baby on USS
    - To ensure that the woman is aware that levels of PAPP-A are not part of the screening programme i.e. it is an incidental finding but will be assessed.

4.3 Low PAPP-A

- Only identified on 1st trimester screening bloods
- Definition (<0.4MoM).
- Low levels of PAPP-A are at increased risk of FGR.

4.3.1 Responsibilities

- The Clinical Lead will assess the blood results and highlight required for serial scans from 28 weeks and pass to the Screening Administrator

4.3.2 Screening administrator

- Arrange the initial 28 week serial growth scan.
- Indicated the reason for the scan on the appointment request
- Send the appointment letter -see Appendix 2;

4.3.3 Sonographers Responsibilities

- Perform growth scans to the Wessex Standards (Wessex Guideline 2018)
- including umbilical artery Doppler and mid-cerebral artery Doppler(MCA where clinically indicated)
- The sonographer will use their clinical judgement in timing of USS and refer as necessary in relation to clinical findings.

4.4 Fetal Echogenic Bowel

Fetal echogenic bowel is normally identified at the routine anomaly scan but can be identified in later pregnancy and is high risk for FGR.

4.4.1 Sonographer responsibilities

- Provide a detailed USS report including any evidence of antenatal bleeding or family history of cystic fibrosis
- refer to the Screening co-ordinator to refer to FMU for confirmation and plan of care and refer to the local Obstetric Consultant
- **Refer to ANC for TORCH Screen bloods**.
    - toxoplasma,
    - Rubella,
    - CMV,
    - Herpes.

4.4.2 Labour Ward Staff responsibilities (postnatal)

- Ensure the serial number of the growth chart is entered on the GROW software
- Identify the reasons for serial scan
- Was SGA/FGR identified in antenatal period?
- Generate the birth centile

4.5 Antenatal management post 1st Trimester USS

4.5.1 Management of the Low risk of FGR Pregnancy –

All low risk women, growth surveillance is by FHM

Only practitioners (including Students) who have successfully completed the Perinatal Institute E-Learning programme on an annual basis should undertake assessment of fetal growth Fundal Height Measurement.

FHM should be measured and plotted on a customised growth chart at every scheduled antenatal appointment from 26-28 weeks of pregnancy.

- **See Flow Chart 2 for Suboptimal FHM**

4.5.2 Management of moderate and high risk of FGR pregnancies –

- Follow Appendix1: Screening and Surveillance of Singleton Pregnancies
- Ensure women are under consultant led care

4.5.3 Women unsuitable for assessment of fetal growth by FHM measurement

- If evidence of early SGA/FGR/short limbs at the anomaly USS refer to FMU
- Normal growth parameters at anomaly scan assessment - USS EFW at 32/40
- Perform FHM at 28/40 and refer if suboptimal growth see Flowchart 2

4.6 Management of Pregnancy/Delivery Planning when SGA/FGR is detected

Antenatal steroids

- All women with FGR and planned for delivery at less than 35+6 weeks must receive a single course of antenatal steroids.

Magnesium sulphate

- To reduce cerebral palsy in high risk pre-term infants (RCOG, 2011). (see local guideline)
  - **24+0 to 29+6 weeks of pregnancy** At least 4 hours prior to caesarean section administer the loading dose and infusion
  - **30+0 to33+6 weeks of pregnancy** magnesium sulphate should be considered

Inpatient monitoring

- Should be reserved for women with FGR at less than 32 weeks with absent/reversed end diastolic flow in whom delivery is anticipated.

Pregnancy <28/40

- Women diagnosed with SGA or FGR (<5th centile) should be managed in accordance with Appendix 3b. (See SOP-Referral to FMU).

Pregnancy ≥28 to ≤weeks

- In the presence of absent/reversed end diastolic flow in UAD at less than 32 weeks see appendix 3c
- Antenatal steroids should not be administered before the FMU assessment.
- FMU unavailable within 24 hours - computerised CTG (cCTG) should be performed.
- If cCTG criteria are met then delivery can be postponed until a fetal medicine opinion is obtained at the next possible opportunity.
- If cCTG criteria are not met then consultant review should take place by a senior obstetrician. (see Computerised CTG Monitoring Guideline see Transfer out Policy)

Pregnancy >32 weeks

- **See appendix 3c** See also: SOP-Preterm Labour Guideline.

Pregnancy < 34 weeks

- For women <34 weeks' gestation, plan for delivery via caesarean section 24 hours after antenatal steroids.

Pregnancy >34 weeks

- See Appendix 3b flow chart

4.6 Neonatal Care planning

- All discussions of planned local delivery should involve the SCBU team.

4.7 Pregnancy <34 weeks of EFW <1.8

(NW FGR Regional Ratified Guideline 2019)

If delivery when EFW<1.8kg or is planned due to FGR then the availability of neonatal care should be identified prior to induction or caesarean delivery. If facilities

are not available, arrangements can be made for transfer to a mainland unit, but only if there is a normal cCTG. If not – arrange for a local delivery with ex-utero neonatal transfer

See Hypoglycaemia prevention and Thermoregulation following Birth guideline

5 Implementation/training/awareness

- This is a review of a current document and it formalises current practice.
- Once ratified it will be available in all clinical areas within the Maternity Unit and on the intranet.
- All new, reviewed and ratified documents are notified to staff via the monthly maternity newsletter
- **Fetal Growth Surveillance Training Assessment– see appendix 3**

6. Auditable Standards

What aspects of compliance with the document will be monitored	What will be reviewed to evidence this	How and how often will this be done	Detail sample size (if applicable)	Who will coordinate findings	Which group or report will receive findings
Completion of the risk assessment algorithm	Maternal Notes	6 monthly	30 records	Ultrasound sonographers	HOM Consultants
Correct use of the 'sticker system' on the GROW charts	Maternal Notes	6 monthly	30 Records	Ultrasound sonographers	HOM Consultants

7. Related Documents:

- SOP-FMU referral
- SOP-Pre term Labour
- SOP-Admission to SCBU
- Hypoglycaemic thermoregulation guideline
- SOP-Dawes Redman
- SOP-Reduced Fetal Movements
- SOP- Mainland Transfer By helicopter
- Wessex Ultrasound guideline
- SOP – Antenatal care

8. References:

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- Gardosi J, Giddings S, Clifford S, Wood L, Francis A. Association between reduced stillbirth rates in England and regional uptake of accreditation training in customised fetal growth assessment. BMJ Open 2013;3(12). https://bmjopen.bmj.com/content/bmjopen/3/12/e003942.full.pdf
- Jayawardena L, Sheehan P. Introduction of a customised growth chart protocol increased detection of small for gestational age pregnancies in a tertiary Melbourne hospital. Aust N Z J Obstet Gynaecol. 2018 https://obgyn.onlinelibrary.wiley.com/doi/abs/10.1111/ajo.12902
- McCowan LME. (2009) Spontaneous preterm birth and small for gestational age infants in women who stop smoking early in pregnancy: prospective cohort study. BMJ 2009;338:1081–2009
- National Institute for Health and Care Excellence. Hypertension in pregnancy: diagnosis and management (Clinical Guideline 133). NICE 2019 www.nice.org.uk/guidance/ng133
- *Rolnik et al (2017)* Aspirin versus Placebo in Pregnancies at High Risk for Preterm Preeclampsia. N engl j med 377;7 nejm.org August 17, 2017
- Royal College of Obstetricians and Gynaecologists Scientific Advisory Committee (2011) *Magnesium sulphate to prevent cerebral palsy following preterm birth* (Opinion Paper 29). London: RCOG.
- Saving Babies’ Lives v.2: A care bundle for reducing perinatal mortality. NHS England, 2019. www.england.nhs.uk/publication/saving-babies-lives-version-two-a-care-bundle-for-reducing-perinatal-mortality
- The investigation and management of the small-for-gestational-age fetus. Green Top Guideline 31. RCOG 2013 https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_31.pdf

9. DISCLAIMER

It is the responsibility of staff to check the Trust intranet to ensure that the most recent version/issue of this document is being referenced.

DOCUMENT HISTORY					
Date of Issue	**Version No.**	**Next Review Date**	**Date Approved**	**Director Responsible for Change**	**Nature of Change**
July 2020	v1	July 2023	23rd July 2020	MCSG	Current documents for GROW/SGA and Low Pappa A reviewed/ amalgamated and ratified

Appendix 1:Aspirin Letter to GP

Dear Doctor

The above patient has been advised in accordance with NICE hypertension Guideline (CG107 amended in 2019) and Saving Babies Lives Version 2 (2019) to take Aspirin 150 mg once daily until birth.

Would you please exclude contraindications to this and provide her the prescription. Contraindication would include severe asthma, stomach ulcers or known allergy to Aspirin.

Kind Regards

Obstetric Team

NICE Guideline on Hypertension in Pregnancy

Women with one of the following risk factors (High Risk)

- hypertensive disease during a previous pregnancy
- chronic kidney disease
- autoimmune disease such as systemic lupus erythematosus or antiphospholipid syndrome
- type 1 or type 2 diabetes
- chronic hypertension

Women with more than one of the following risk factors (Moderate risk factor)

- first pregnancy
- age 40 years or older
- pregnancy interval of more than 10 years
- body mass index (BMI) of 35 kg/m2 or more at first visit
- family history of pre-eclampsia
- multi-fetal pregnancy
-

Saving Babies Lives Version Two

Previous SGA baby (less than 10th centile on customised growth chart)

Appendix 2: Patient Information: Low PAPP-A Letter with patient information

Antenatal Clinic
St Marys NHS Trust
Parkhurst Road
Isle of Wight
PO30 5TG

Date

Dear

Scan Appointment: If you wish to change your appointment date or time please call the appointments line 01983 524197.

Please put this letter in your maternity notes.

We would like to offer you further growth scans later in your pregnancy. Your screening result for Down's, Edward's and Patau's Syndromes found a low level of PAPP-A. This result does not increase your chance of those three chromosomes but is found when looking at your bloods taken at that time.

Pregnancy associated plasma protein A (PAPP-A) is a hormone that is produced by your baby's placenta (after birth). PAPP-A is one of the two hormones that are measured during the 12 week combined screening test.

Some studies have shown that low PAPP-A suggest yours baby's growth may be affected. To reassure you (and us) that your baby is growing well

We have booked a scan for you as above at St Marys Maternity Ultrasound Scan Department at around 28 weeks of pregnancy. As well as checking the baby's growth, the sonographer (person performing the ultrasound scan) will check the blood flow (Doppler) through the cord and placenta (after-birth) and the amniotic fluid (water) levels. If your baby is growing well and the fluid volume is normal, you will be invited for ultrasound scan appointments every 3-4 weeks to continue to monitor your baby's growth. If you feel you need additional information, you can discuss this letter with your Community Midwife or see this link https://www.rcog.org.uk/globalassets/documents/guidelines/gtg_31.pdf

Is there anything I can do help my baby to grow well?

If you smoke, it is extremely important that you stop. Smoking can affect the placenta and your baby's growth. Your midwife can refer you for help to stop smoking

Yours Sincerely

Amanda Rendell
Clinical Lead Antenatal Clinic

Appendix 3: Fetal Growth Surveillance Training Assessment

Record of Achievement. In Performing Fetal Growth Surveillance - Fundal Height Measurement

To verify competence please ensure that you have the appropriate level signed as a record of your achievement in the boxes below either by the educator/ trainer if attendance on study session and or the workplace assessor when performed in practice

Competency Indicators 1st Level (HCAs & MWs	Assess or Sign	Competency Indicators 2nd Level	Assess or Sign	Competency Indicators 3rd Level	Assess or Sign	Competency Indicators 4th Level	Assessor Sign
a) Can access online GROW software and produce a customised growth chart for a client. c) Familiar with the Trust Fetal Growth Assessment SOP and the RCOG guideline on the investigation and management of small for gestational age fetus d) Can differentiate between normal and abnormal growth/growth velocity. e)Understands importance of improved accuracy of measuring by same person f)Understand importance of using unique number to generate GAP centile		a) Has undertaken GROW training and fundal height. b) Can accurately measure fundal height and plot on customised growth chart. c) Demonstrates understanding of when to refer for further investigation based on risk assessment and ongoing fetal growth surveillance. d) Can describe pathway for referral and how to refer a client for further assessment by Consultant/ultrasound e) Able to identify plotting errors and refer to appropriate clinician		a) Able to supervise junior midwives and student midwives in undertaking fetal growth measurements		a) Actively involved in teaching fetal growth surveillance, both practical and use of the software and E-Learning facility. b) Actively involved in audit of programme effectiveness in identifying the growth affected fetus. c) Understanding link between GROW and Saving Babies Lives Bundle to identify those babies at risk of stillbirth	

Training Support							
Level 1		Level 2		Level 3		Level 4	
www.gestation.net/grow One to one training provided by practice education team and cascade trainers Access to GROW chart audit via intranet		IOW NHS Trust Policies and SOPs re Fetal Growth Surveillance and Management GAP – Growth Assessment Protocol training online Access GAP e-learning package annual update evidence		Royal College of OBS and Gynae (RCOG green top guideline Access one day study day and e-learning package provided by the Perinatal Institute			